

# ZENSOL

WWW.ZENSOL.COM



HIGH PERFORMANCE  
CIRCUIT BREAKER ANALYZER  
CBV-32

# PURPOSE OF THIS DOCUMENT

## CBV-32

This document has been written to present you the CBV-32, a new High Voltage Circuit Breaker analyzer designed and built by Zensol.

## CBV-32 AND CBA-32P

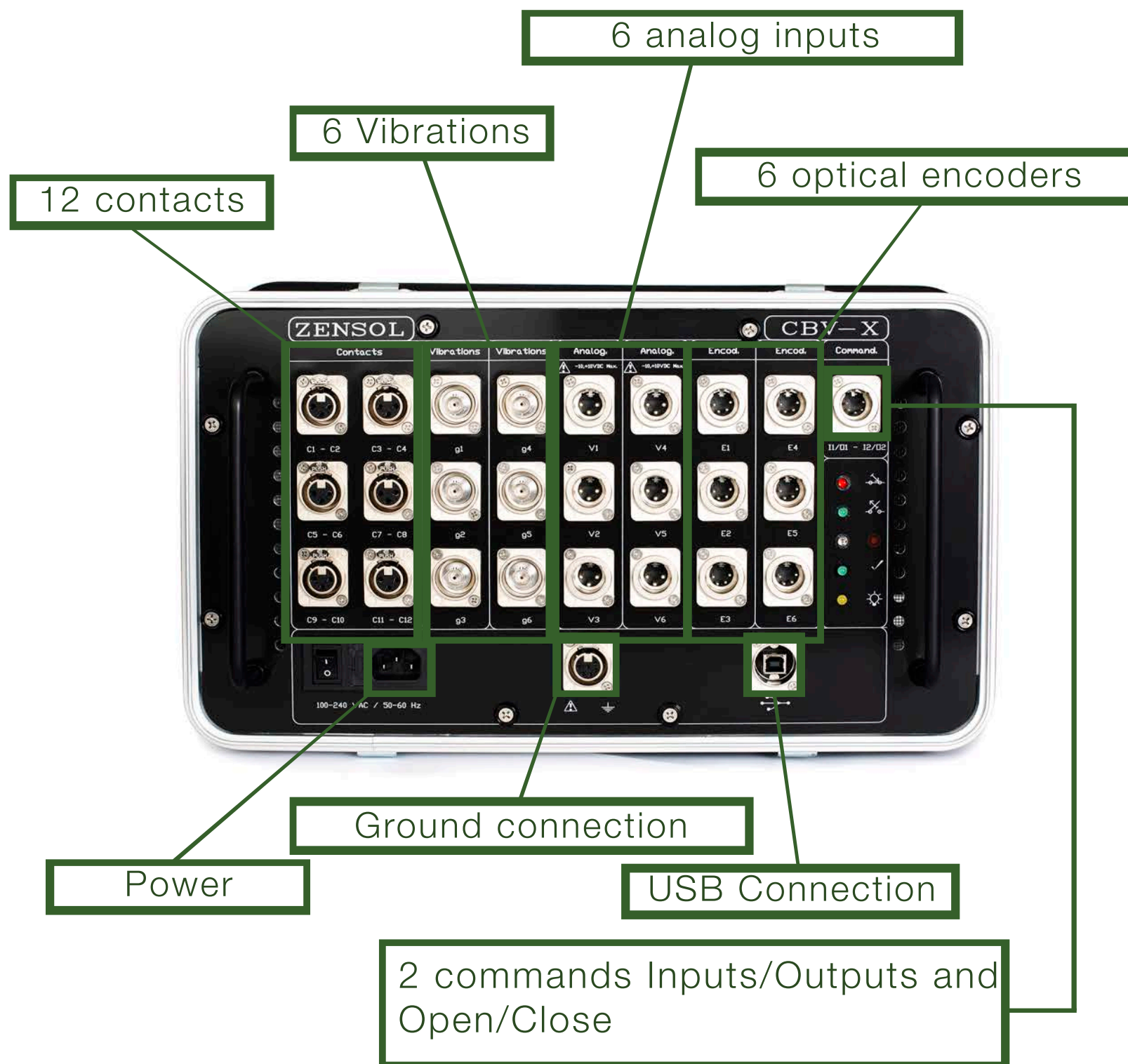
We will use this opportunity to make a brief comparison between the existing CBA-32P instrument and the new CBV-32.

## DID YOU KNOW?

The CBA-32P is still available with its 24 dry contacts whereas the 8 and the 16 dry contacts options have been replaced by the new CBV-X.

# WHAT IS THE CBV-X?

The CBV-X is the only instrument able to perform in a SINGLE test timing, motion, vibration and dynamic resistance of contacts associated to different measurements of current and voltage.



# QUICK COMPARAISON BETWEEN CBA-32P AND CBV-32

CBA-32P

CBV-32



24 contacts

Fiber optic link



12 contacts

6 vibrations

USB

The CBA-32P and the CBV-32 share the same cables, same modules and the same accessories.

In red: The differences

In green: The commonalities

# COMPARISON OF THE CHARACTERISTICS BETWEEN THE CBA-32P AND CBV-32

	CBA-32P characteristics	CBV-32 characteristics
<b>Sampling frequency</b>	10khz	200khz
<b>Sampling time</b>	100 microseconds ( $\mu$ s)	5 microseconds ( $\mu$ s)
<b>Analog inputs</b>	0-10 Volts	-10, +10 Volts
<b>Analog/Digital Conversion</b>	12 bits	16 bits
<b>External trigger</b>	—	Works on any analog input Rising or falling edge AC or DC Signals

# PROBLEMS DETECTED AND METHODS OF TESTING ON CIRCUIT BREAKERS

Detected problems	Test methods	CBA-32P		CBV-32	
		Online	Offline	Online	Offline
Contact timing	Timing test		X		X
Contact bounce	Timing/motion test		X		X
Bad damping	Motion test		X		X
Main contact wear	Micro-ohmmeter test		X		X
Arcing contact wear	Dynamic resistance test		X		X
Open and close coil assessment	Coil current test	X	X	X	X
Motor assessment	Current and voltage test	X	X	X	X
First trip	Measure current over 3 phases	X		X	X
Bad mechanical adjustment	Vibration test			X	X
Bad alignment	Vibration test			X	X
Bad contact timing	Vibration test			X	X

# TIMING



ARCTIC CABLES FOR CONTACTS



CABLE EXTENSION CONTACT/DISPLACEMENT



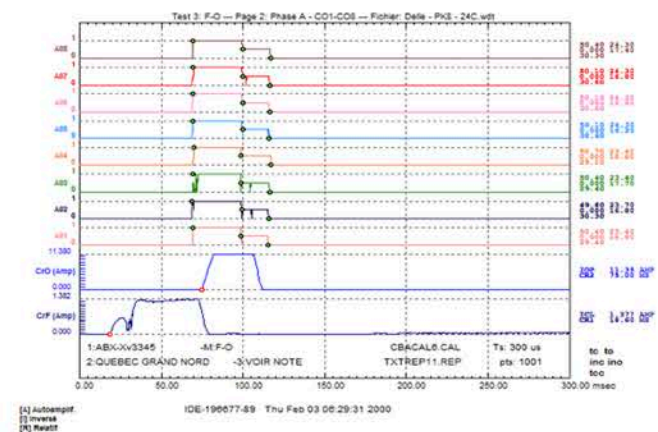
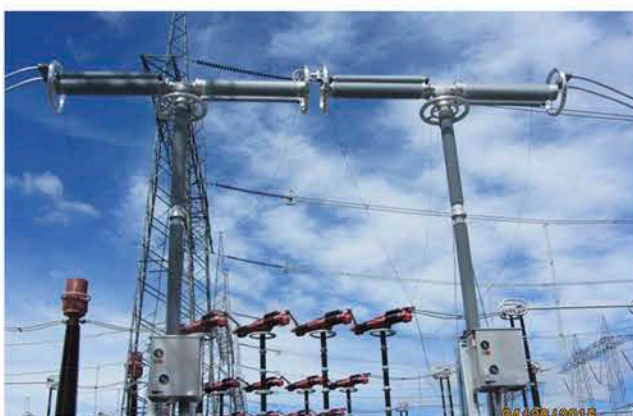
GROUND CABLE



COMMAND CABLE



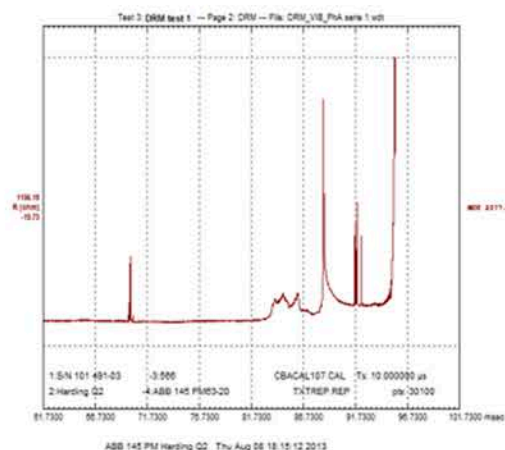
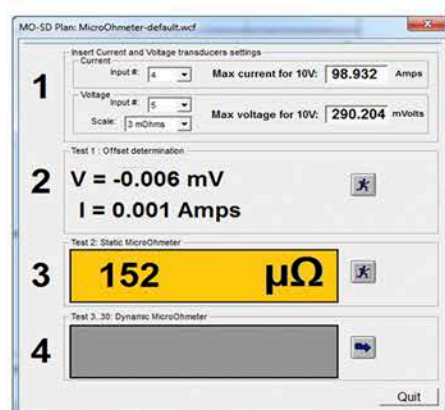
52 a/b CABLE



# DYNAMIC RESISTANCE DRM



The figure on the left shows the static resistance of a main contact (as given by a micro-ohmmeter) while the figure on the right shows the dynamic resistance of an arc contact.



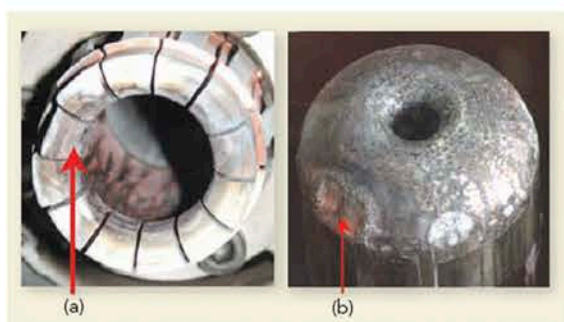


# DYNAMIC RESISTANCE (DRM) WHY?

Dynamic Contact Resistance Measurement (DRM) is a widely recognized method to determine the condition of a breaker's main and arcing contacts, without opening it. The DRM test (KIT MO-SD) is the ideal tool to observe the changes on the contacts as a function of time.

For circuit breakers, this resistance may be measured either at the rated speed or at slow speed, during an open operation.

Bad contact alignment



Arc pitting on fixed contacts



Detected problems	Static micro-ohmmeter	Dynamic micro-ohmmeter
Arcing contact wear		X
Arcing contact length		X
Main contact wear	X	X
Bad contact alignment		X
Bad contact adjustment		X
Hot spots (High joint resistance)	X	X
Contacts fingers		X
Contact surfaces		X
Blasting nozzles		X
Crossing joints		X

# VIBRO-ACOUSTIC, WHY?

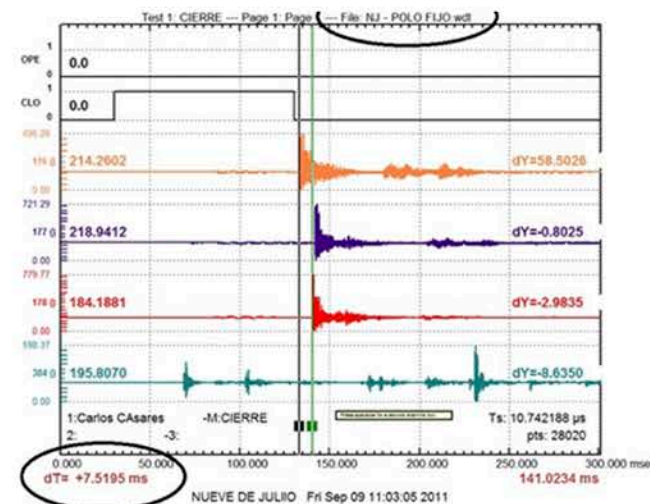


Accelerometer



Mounting base

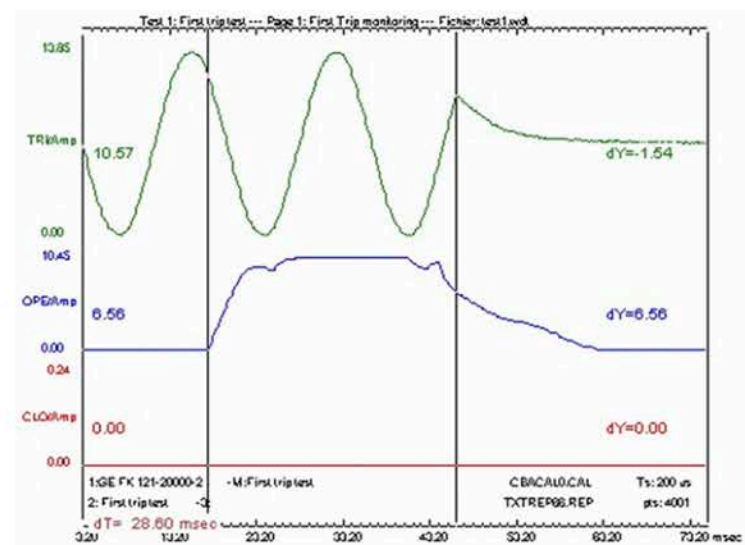
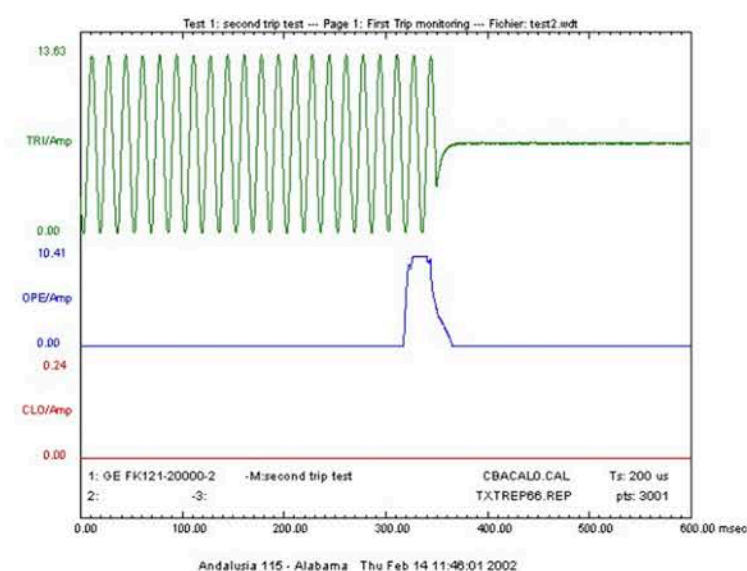
- Non-intrusive
- Identify problems that classical tests cannot detect
  - On-line/Off-line
- Timing test easily done on-line



# FIRST TRIP MONITORING Z-FT



Example of high voltage line current tripping



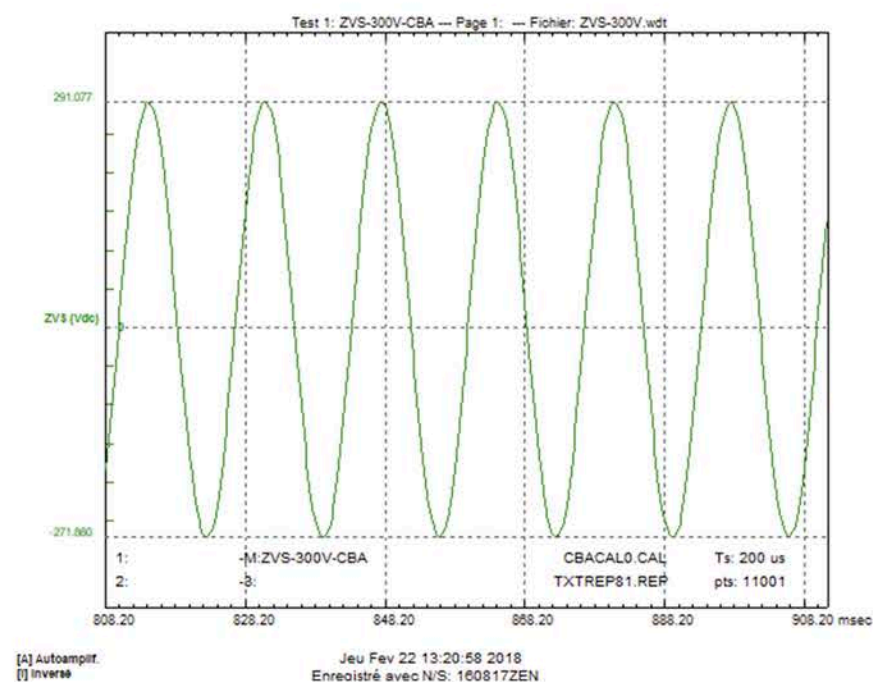
# VOLTAGE TRANSDUCER

## ZVS-300V



Voltage transducer from -300V, +300V input voltage with analog output -10V, +10V.

For example, during a timing test, the ZVS-300V allows you to measure the variation of the battery voltage 129VDC or yet again the voltage signal of 120VAC, 240VAC.

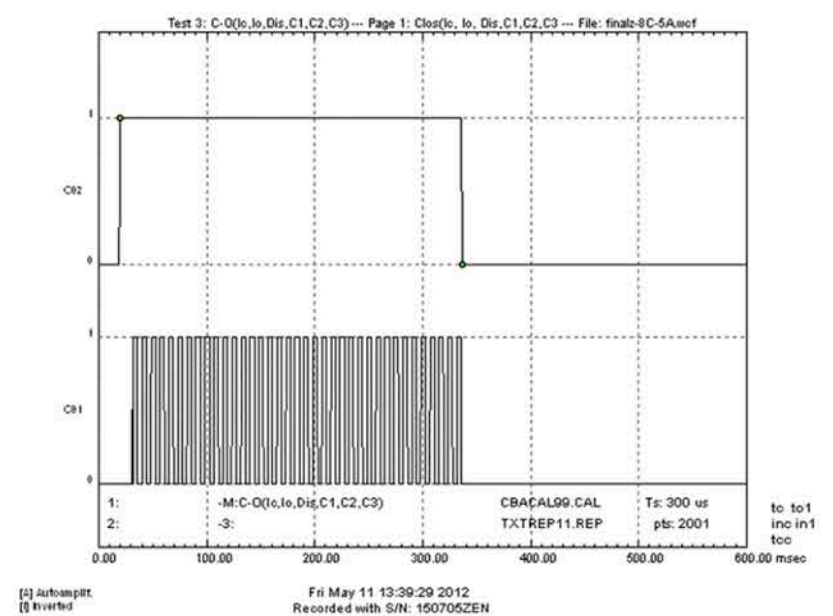


# VOLTAGE TRANSDUCER

## ZVD-AC-DC-300-CONTACT



Voltage transducer between 0 and +/- 300V with digital output 0 and 1.  
 For example, during a timing test, the ZVD-AC-DC-300-CONTACT allows you to observe the timing of a "live" contact of 129VDC. The digital output will be 0 if the input voltage is less than 60VDC and 1 if the input voltage is greater than 60VDC.



# CURRENT CLAMP AC/DC 30A CT-CLAMP-AC/DC



For example, by using several of these current clamps, additional coil currents can be measured during closing/opening of contacts during timing tests.



# MOTION TEST KIT ZLB



For linear measurements, use the resistive motion transducer ZLT or the digital ZLD-200.



# MOTION TEST KIT ZLR



Transform a linear motion into a rotary motion.





# MOTION TEST KIT ZMS



Allows you to fix any types of sensors (resistive or optical) on any circuit breakers.



# PRESSURE TRANSDUCER

## ZPS 5000



Measurement of the instantaneous variation of pressure during opening or closing operations.



A complete and innovative  
solution for testing high-voltage  
circuit breakers!

## MODULAR SOLUTION

A modular solution that allows you to buy the different available modules according to your needs.

## CONSTANT INNOVATION

Zensol is constantly creating new modules compatibles with the CBA and CBV (call us for more information).



## HOURS

Monday to Friday  
8:30am to 5pm



## E-MAIL

[info.support@zensol.com](mailto:info.support@zensol.com)



## ADDRESS

Zensol Automation Inc.  
2281 Guénette street  
Saint-Laurent QC H4R 2E9, Canada



## PHONE

Sales: +1 (514) 333-3488	ext 1
Technical support: +1 (514) 333-3488	ext 2
Accounting: +1 (514) 333-3488	ext 3